

AMENDMENTS TO THE CLAIMS

Claims 1-27 (Cancelled)

28. (Currently Amended) A component feeder for feeding wafer feed components and tray feed components to be mounted on a board, from a wafer feeding plate on which a wafer having a plurality of the wafer feed components is placed and from a tray feeding plate on which a component feeding tray having a plurality of the tray feed components is placed, ~~out of components to be mounted on a board, the wafer feed components and the tray feed components~~ while allowing the wafer feed components and tray feed components to be mounted, ~~the said~~ component feeder comprising:

a plate placing device for ~~which~~ selectively placing and holding either the wafer feeding plate of the plates or the tray feeding plate and allowing ~~the~~ a wafer feed component or ~~the~~ a tray feed component to be fed from the wafer feeding tray or the component feeding tray, respectively, ~~and~~

the plate placing device ~~serving~~ for placing and holding either the wafer feeding plate or the tray feeding plate so that a feeding height of the wafer feed component on the wafer feeding plate and a feeding height of the tray feed component on the tray feeding plate ~~become~~ are approximately equal to each other.

29. (Currently Amended) The component feeder as defined in claim 28, wherein the plate placing device comprises:

an elastic support member, which is able to support the placed wafer feeding plate or placed tray feeding plate from a lower surface side in a vicinity of ~~its~~ an outer peripheral portion, of the placed wafer feeding plate or the placed tray feeding plate, said elastic support member having a variable ~~and of which~~ support height position ~~is variable~~;

a plate pressurizing member for holding the wafer feeding plate or the tray feeding plate by pressurizing the wafer feeding plate or the tray feeding plate supported by the elastic support member from an upper surface side of the wafer feeding plate or the tray feeding plate in the vicinity of the outer peripheral portion so that the wafer feeding plate or the tray feeding plate is held between the plate pressurizing member and the elastic support member; and

a pressurizing member elevating unit for moving up and down the plate pressurizing member

, and

~~the pressurizing member elevating unit moves up and down the plate pressurizing member~~ to vary the support height position of the elastic support member so that the feeding height of the wafer feed component on the wafer feeding plate and the feeding height of the tray feed component on the tray feeding plate ~~[[,]]~~ being supported by the elastic support member ~~become~~ are approximately equal to each other.

30. (Previously Presented) The component feeder as defined in claim 29, wherein

the plate placing device further comprises a regulation part for selectively regulating a position in which the plate pressurizing member is lowered by the pressurizing member elevating unit, and

the position in which the plate pressurizing member is lowered is regulated by the regulation part so that the feeding height of the tray feed component becomes approximately equal to the feeding height of the wafer feed component when the tray feeding plate is placed on the plate placing device.

31. (Currently Amended) A component feeder for feeding wafer feed components and tray feed components to be mounted on a board, from a wafer feeding plate on which a wafer having a plurality of the wafer feed components is arranged and from a tray feeding plate on which a component feeding tray having a plurality of the tray feed components is arranged, ~~out of~~ ~~components to be mounted on a board, the wafer feed components and the tray feed components~~ while allowing the wafer feed components and tray feed components to be mounted,

the component feeder comprising:

a plate receiving part for receiving ~~the~~ a plurality of wafer feeding plates and ~~the~~ a plurality of tray feeding plates while allowing the wafer feeding plates or the tray feeding plates to be discharged;

a plate placing device for selectively placing and holding ~~either a selected plate of either~~

the wafer feeding plates or the tray feeding plates and allowing the wafer feed component or the tray feed component to be fed from the wafer feeding tray or the component feeding tray, respectively; and

a plate moving device for releasably holding the selected plate, discharging the selected plate from the plate receiving part, and moving the selected plate while allowing the selected plate to be held by the plate placing device, and

the plate placing device comprising:

a plurality of elastic support members, which are able to support the ~~placed~~selected plate from a lower surface side in a vicinity of ~~its an~~ outer peripheral portion of the selected plate and of which support height positions are variable;

a plate pressurizing member for holding the selected plate by pressurizing the selected plate supported by the elastic support members from an upper surface side in the vicinity of the outer peripheral portion so that the selected plate is held between the plate pressurizing member and the elastic support members; and

a pressurizing member elevating unit for moving up and down the plate pressurizing member; and

a regulation part for selectively regulating a position in which the plate pressurizing member is lowered by the pressurizing member elevating unit,

wherein the support height of the tray feeding plate by the elastic support members can be held by regulating the position where the plate pressurizing member is lowered by the regulation part when the tray feeding plate is placed on the plate placing device, and

when the wafer feeding plate is placed on the plate placing device, the wafer placed on the wafer feeding plate can be expanded by releasing regulation of the lowered position by the regulation part and lowering the plate pressurizing member by the pressurizing member elevating unit while supporting the wafer feeding plate by the elastic support members.

32. (Currently Amended) The component feeder as defined in claim 31, wherein the wafer feeding plate comprises:

a wafer sheet to which ~~the~~a wafer that has undergone dicing adheres; and

a wafer ring, which is an annular plate and holds the wafer sheet so that the wafer that has undergone dicing is positioned inside thereof,

the plate placing device further comprises an expanding member that has an annular contact portion capable of coming in contact with a lower surface of the wafer sheet between an outer periphery of the wafer that has undergone dicing and an inner periphery of the wafer ring at the wafer feeding plate in a state in which the wafer ring is supported by the elastic support members, and

the wafer that has undergone dicing can be expanded by radially expanding the wafer sheet by lowering the plate pressurizing member by the pressurizing member elevating unit using the annular contact portion of the expanding member as a fulcrum and thus depressing the wafer ring.

33. (Currently Amended) The component feeder as defined in claim 31, wherein

the plate moving device comprises:

a holding part for releasably holding the selected plate;

a holding part moving unit for moving the holding part so as to move the selected plate held by the holding part from the plate receiving part to the plate placing device; and

a plate identifying part for identifying whether the held selected plate is the wafer feeding plate or the tray feeding plate based on a configuration of the holding part of the held selected plate, and

the regulation part of the plate placing device regulates the position where the plate pressurizing member is lowered based on an identification result of the plate identifying part.

34. (Previously Presented) The component feeder as defined in claim 32, wherein

the tray feeding plate comprises:

a tray placing part, on which a plurality of the component feeding trays are detachably placed; and

a tray ring, which is an annular plate formed at a periphery of the tray placing part, and the plate placing device is able to support the tray ring by the elastic support members

and hold the tray feeding plate by holding and pressurizing the tray ring between the plate pressurizing member and the elastic support members, and the regulation part regulates the position where the plate pressurizing member is lowered by the pressurizing member elevating unit so that a lower surface of the tray feeding plate does not come in contact with the expanding member.

35. (Previously Presented) The component feeder as defined in claim 34, wherein the tray placing part comprises:

a fixed side holding member, which is able to come in contact with one end portion of a roughly quadrangle configuration of the component feeding tray that has the roughly quadrangle shape in plan; and

movable side holding members, which are able to come in contact with an end portion opposite to the one end portion of the component feeding tray in a state in which the one end portion is brought in contact with the fixed side holding member and allows the opposite end portion to be movably urged toward the fixed side holding member, and

a placement position of the component feeding tray in the tray placing part is held so as to hold the component feeding tray by the fixed side holding member and the movable side holding members.

36. (Currently Amended) The component feeder as defined in claim 31, wherein

at least one elastic support member of the plurality of elastic support members has a slant end portion, which has its end portion come in contact with the end portion of the supported plate, thereby regulating a support position in a direction along a surface of the selected plate.

37. (Previously Presented) The component feeder as defined in claim 31, wherein the regulation part comprises:

a contact portion, which is able to come in contact with a lower portion of the plate pressurizing member and regulate the position where the plate pressurizing member is lowered by the contact; and

a contact portion moving mechanism for moving the contact portion between a contact position where the contact portion is come in contact with the plate pressurizing member and a retreat position where the contact portion is retreated.

38. (Previously Presented) The component feeder as defined in claim 31, wherein

the pressurizing member elevating unit of the plate placing device comprises:

a cylinder portion for moving up or down the plate pressurizing member by supplying or discharging compressed air;

an elevation compressed air supplying part, which is able to supply elevation compressed air for performing the upward or downward movement as the compressed air to the cylinder portion;

a retention compressed air supplying part, which has a pressure lower than that of the elevation compressed air and is able to supply retention compressed air for retaining a stop position of the plate pressurizing member when the plate pressurizing member stops moving up or down as the compressed air to the cylinder portion; and

a compressed air selection valve for selectively supplying the elevation compressed air or the retention compressed air to the cylinder portion.

39. (Previously Presented) The component feeder as defined in claim 38, wherein

the compressed air selection valve is a mechanical lock valve, which is able to detect an upper end position of elevation of the plate pressurizing member by mechanically coming in contact with the plate pressurizing member, for selectively supplying the retention compressed air to the cylinder portion in place of the elevation compressed air when the upper end position is detected.

40. (Currently Amended) The component feeder as defined in claim 33, wherein

the plate receiving part comprises:

a receiver for receiving the wafer feeding plates or the tray feeding plates in a stack;
and

a receiver elevating unit for positioning one plate of the wafer feeding plates or the tray feeding plates received in the receiver into an elevation height position in which the one plate can be held by the holding portion of the plate moving device by moving up and down the receiver, and

an openable jump preventing plate, which has a plate outlet portion that allows the one held plate together with the holding part to pass therethrough, and a plate regulation part, which is formed at a periphery of the outlet portion and is able to prevent the plates that are other than the one plate and are received in the receiver of the plate receiving part from jumping out of the receiver.

41.(Previously Presented) The component feeder as defined in claim 40, wherein

the plate placing device further comprises a jump detecting unit, which is able to detect the plate located in the outlet portion of the jump preventing plate.

42. (Currently Amended) The component feeder as defined in claim ~~34~~40, wherein the plate receiving part comprises:

a base for supporting the receiver and the receiver elevating unit; and

a base retention part, which has a linear motion guide portion that can retain a position where the base is placed, for guiding a linear motion of the base by releasing the retention, and a pivot guide portion for guiding a rotational motion of the base, and

the base comprises an engagement portion, which can be selectively engaged with the linear motion guide portion and the pivot guide portion,

the base can be linearly moved by engaging the engagement portion with the linear motion guide portion, and

the base can be moved while rotating by releasing the engagement between the engagement portion and the linear motion guide portion and engaging the engagement portion with the pivot guide portion.

43. (Currently Amended) The component feeder as defined in claim ~~34~~40.

the receiver of the plate receiving part comprises a plurality of sets of support guide portions for individually supporting mutually opposed each end portions of each of the wafer feeding plates or the tray feeding plates, which are arranged mutually opposed to guide a movement in a direction along a surface of the plate in discharging each of the wafer feeding plates or the tray feeding plates, and

wherein a contact portion to each support guide portion of each of the wafer feeding plates or the tray feeding plates has a smooth surface portion.

44. (Currently Amended) The component feeder as defined in claim 43, wherein a slant portion with respect to a movement direction is formed at an insertion end portion of the support guide portions of the each set while enabling correction of positional deviation between an insertion position of each of the plates to the support guide portions of the each set in a direction roughly perpendicular to the movement direction of each of the wafer feeding plates or the tray feeding plates and a support position of the support guide portions of the each set.

45. (Currently Amended) The component feeder as defined in claim 43, wherein contact surfaces between each of the wafer feeding plates or the tray feeding plates and the support guide portions are formed so that a hardness of the contact surface of the support guide portion is smaller than that of the selected plate.

46. (Currently Amended) The component feeder as defined in claim 43, wherein contact surfaces between each of the wafer feeding plates or the tray feeding plates and the support guide portions are formed so that a hardness of the contact surface of the selected plate is smaller than that of the support guide portion.

47. (Currently Amended) The component feeder as defined in claim 43, wherein the support guide portions comprise roller portions rotatable along a surface of the end portion while supporting the end portion of each of the wafer feeding plates or the tray feeding plates.

48. (Currently Amended) The component feeder as defined in claim 31, wherein
the plate pressurizing member has a lower surface further comprising:
a plurality of support members for supporting the plate fed to the plate placing device
while allowing the plate to be discharged; and
a plurality of urging members for consistently urging the selected plate against the
support members or the elastic support members regardless of the position where the plate
pressurizing member is lowered by the pressurizing member elevating unit.

49. (Currently Amended) The component feeder as defined in claim 48, wherein
each of the urging members comprise an urging roller portion rotatable along a surface of
the selected plate while urging the selected plate supported by the support members to allow the
selected plate to be moved by the plate moving device.

50. (Currently Amended) The component feeder as defined in claim 33, wherein
each of the wafer feeding plates or the tray feeding plates has an engagement portion
capable of being engaged with the holding part in a holding position on the upper surface side of
the selected plate by the holding part.

51. (Currently Amended) The component feeder as defined in claim 43, wherein
the receiver further comprises a plurality of posture guide portions for guiding a support
posture in a horizontal direction of each of the plates by being arranged between the sets of the
support guide portions and being engaged with each of the wafer feeding plates or the tray
feeding plates.

52. (Currently Amended) The component feeder as defined in claim 51, wherein
the receiver has an openable and closable cover portion for replacing each of the wafer
feeding plates or the tray feeding plates, and the posture guide portions are provided inside the
cover portion.

53. (Previously Presented) The component feeder as defined in claim 52, wherein the receiver comprises an open/close detection sensor for detecting opening or closing of the cover portion.

54. (Previously Presented) The component feeder as defined in claim 42, wherein the receiver comprises a plurality of fixing parts for fixing the support to a support surface of the base, and at least one of the fixing parts is formed of a conductive material having a function as a ground terminal portion.